

**SEARCH COPY****PCT****REQUEST**

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only	
<b>PCT/US 00/26858</b>	
International Application No.	
(29.09.00)	29 SEP 2000
International Filing Date	
<b>PCT INTERNATIONAL APPLICATION RO/US</b>	
Name of receiving Office and "PCT International Application"	
Applicant's or agent's file reference (if desired) (12 characters maximum)	1237-PCT-00

**Box No. I TITLE OF INVENTION**  
METHOD AND SYSTEM FOR PROVIDING DATA SECURITY USING FILE SPOOFING

**Box No. II APPLICANT**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

INFRAWORKS CORPORATION  
504 Lavaca Street  
Suite 1100  
Austin, Texas 78701  
US

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:  
US

State (that is, country) of residence:  
US

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

**Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

FRIEDMAN, George  
7109 Montana Norte  
Austin, Texas 78731  
US

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
US

State (that is, country) of residence:  
US

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

**Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

SCHNADER HARRISON SEGAL & LEWIS LLP  
1600 Market Street - Suite 3600  
Philadelphia, Pennsylvania 19103-7286  
US

Telephone No.  
215-751-2475

Facsimile No.  
215-568-2658

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTOR(S)**

*If none of the following sub-boxes is used, this sheet is not to be included in the request.*

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

STAREK, Robert Phillip  
3609 Del Robles  
Austin, Texas 78727  
US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
US

State (that is, country) of residence:  
US

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

MURDOCK, Carlos  
4517 Avenue F  
Austin, Texas 78751  
US

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
US

State (that is, country) of residence:  
US

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates                  | <input checked="" type="checkbox"/> LR Liberia   |
| <input checked="" type="checkbox"/> AL Albania                               | <input checked="" type="checkbox"/> LS Lesotho   |
| <input checked="" type="checkbox"/> AM Armenia                               | <input checked="" type="checkbox"/> LT Lithuania   |
| <input checked="" type="checkbox"/> AT Austria                               | <input checked="" type="checkbox"/> LU Luxembourg  |
| <input checked="" type="checkbox"/> AU Australia                             | <input checked="" type="checkbox"/> LV Latvia  |
| <input checked="" type="checkbox"/> AZ Azerbaijan                            | <input checked="" type="checkbox"/> MA Morocco   |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina                | <input checked="" type="checkbox"/> MD Republic of Moldova   |
| <input checked="" type="checkbox"/> BB Barbados                              | <input checked="" type="checkbox"/> MG Madagascar  |
| <input checked="" type="checkbox"/> BG Bulgaria                              | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia                             |
| <input checked="" type="checkbox"/> BR Brazil                                |  |
| <input checked="" type="checkbox"/> BY Belarus                               | <input checked="" type="checkbox"/> MN Mongolia  |
| <input checked="" type="checkbox"/> CA Canada                                | <input checked="" type="checkbox"/> MW Malawi  |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein  | <input checked="" type="checkbox"/> MX Mexico  |
| <input checked="" type="checkbox"/> CN China                                 | <input checked="" type="checkbox"/> NO Norway  |
| <input checked="" type="checkbox"/> CR Costa Rica                            | <input checked="" type="checkbox"/> NZ New Zealand   |
| <input checked="" type="checkbox"/> CU Cuba                                  | <input checked="" type="checkbox"/> PL Poland  |
| <input checked="" type="checkbox"/> CZ Czech Republic                        | <input checked="" type="checkbox"/> PT Portugal  |
| <input checked="" type="checkbox"/> DE Germany                               | <input checked="" type="checkbox"/> RO Romania   |
| <input checked="" type="checkbox"/> DK Denmark                               | <input checked="" type="checkbox"/> RU Russian Federation  |
| <input checked="" type="checkbox"/> DM Dominica                              | <input checked="" type="checkbox"/> SD Sudan   |
| <input checked="" type="checkbox"/> EE Estonia                               | <input checked="" type="checkbox"/> SE Sweden  |
| <input checked="" type="checkbox"/> ES Spain                                 | <input checked="" type="checkbox"/> SG Singapore   |
| <input checked="" type="checkbox"/> FI Finland                               | <input checked="" type="checkbox"/> SI Slovenia  |
| <input checked="" type="checkbox"/> GB United Kingdom                        | <input checked="" type="checkbox"/> SK Slovakia  |
| <input checked="" type="checkbox"/> GD Grenada                               | <input checked="" type="checkbox"/> SL Sierra Leone  |
| <input checked="" type="checkbox"/> GE Georgia                               | <input checked="" type="checkbox"/> TJ Tajikistan  |
| <input checked="" type="checkbox"/> GH Ghana                                 | <input checked="" type="checkbox"/> TM Turkmenistan  |
| <input checked="" type="checkbox"/> GM Gambia                                | <input checked="" type="checkbox"/> TR Turkey  |
| <input checked="" type="checkbox"/> HR Croatia                               | <input checked="" type="checkbox"/> TT Trinidad and Tobago   |
| <input checked="" type="checkbox"/> HU Hungary                               | <input checked="" type="checkbox"/> TZ United Republic of Tanzania   |
| <input checked="" type="checkbox"/> ID Indonesia                             | <input checked="" type="checkbox"/> UA Ukraine   |
| <input checked="" type="checkbox"/> IL Israel                                | <input checked="" type="checkbox"/> UG Uganda  |
| <input checked="" type="checkbox"/> IN India                                 | <input checked="" type="checkbox"/> US United States of America  |
| <input checked="" type="checkbox"/> IS Iceland                               |  |
| <input checked="" type="checkbox"/> JP Japan                                 | <input checked="" type="checkbox"/> UZ Uzbekistan  |
| <input checked="" type="checkbox"/> KE Kenya                                 | <input checked="" type="checkbox"/> VN Viet Nam  |
| <input checked="" type="checkbox"/> KG Kyrgyzstan                            | <input checked="" type="checkbox"/> YU Yugoslavia  |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> ZA South Africa  |
|  | <input checked="" type="checkbox"/> ZW Zimbabwe  |
| <input checked="" type="checkbox"/> KR Republic of Korea                     | Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet: |
| <input checked="" type="checkbox"/> KZ Kazakhstan                            | <input type="checkbox"/>   |
| <input checked="" type="checkbox"/> LC Saint Lucia                           | <input type="checkbox"/>   |
| <input checked="" type="checkbox"/> LK Sri Lanka                             |  |

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

**Supplemental Box***If the Supplemental Box is not used, this sheet should not be included in the request.*

1. If, in any of the Boxes, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:

- (i) If more than two persons are involved as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;
- (ii) If, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States Indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;
- (iii) If, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;
- (iv) If, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
- (v) If, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;
- (vi) If, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;
- (vii) If, in Box No. VI, the earlier application is an ARIPO application: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed.

2. If, with regard to the precautionary designation statement contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.

3. If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning non-prejudicial disclosures or exceptions to lack of novelty: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below.

## Continuation of Box IV:

Christenbury, T. Daniel  
 Donatiello, Guy T.  
 Taufer, Paul A.  
 Drobile, James A.  
 Miller, Austin R.  
 Weiser, Gerard J.  
 Kluger, Joan T.  
 Patane, Michael A.  
 McKinley, Robert A.  
 Fenick, Sharon  
 Wiener, Stewart M.  
 Rowe, Felicity E.

All of the above are members of the firm of Schnader, Harrison, Segal & Lewis, LLP, at the address in Box IV.

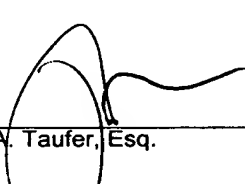
Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) 01 October 1999 (01.10.99)	60/157,472	US		
item (2) 25 May 2000 (25.05.00)	60/206,947	US		
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): 1 and 2

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY	
<b>Choice of International Searching Authority (ISA)</b> (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):  ISA/JS	<b>Request to use results of earlier search; reference to that search</b> (if an earlier search has been carried out by or requested from the International Searching Authority): Date (day/month/year)      Number      Country (or regional Office)

Box No. VIII CHECK LIST: LANGUAGE OF FILING	
This international application contains the following number of sheets:  request : 5 description (excluding sequence listing part) : 9 claims : 5 abstract : 1 drawings : 3 sequence listing part of description : 0 Total number of sheets : 23	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify):
<b>Figure of the drawings</b> which should accompany the abstract: 1	<b>Language of filing</b> of the international application: English

Box No. IX SIGNATURE OF APPLICANT OR AGENT
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).  <div style="text-align: center;">           Paul A. Tauber, Esq.       </div> <div style="text-align: right;">         (29.09.00)       </div>

For receiving Office use only		2. Drawings:  <input type="checkbox"/> received:  <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:	526 Rec'd PCT/PTO 29 SEP 2000	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA/US	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only
Date of receipt of the record copy by the International Bureau:

# PCT

## FEE CALCULATION SHEET

### Annex to the Request

For receiving Office use only

**PCT/US 00/26858**

International application No. **00/26858**

**29 SEP 2000**

Date stamp of the receiving Office

Applicant's or agent's file reference **1237-PCT-00**

Applicant  
**INFRAWORKS CORPORATION**

#### CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE .....	240.00	T	
2. SEARCH FEE .....	450.00	S	
International search to be carried out by <b>USPTO</b>			
<i>(If two or more International Searching Authorities are competent in relation to the international application, indicate the name of the Authority which is chosen to carry out the international search.)</i>			
3. INTERNATIONAL FEE			
<b>Basic Fee</b>			
The international application contains <b>23</b> sheets.			
first 30 sheets .....	427.00	b1	
<b>0</b> x <b>\$10.00</b>	0.00	b2	
remaining sheets additional amount			
Add amounts entered at b1 and b2 and enter total at B	427.00	B	
<b>Designation Fees</b>			
The international application contains <b>83</b> designations.			
<b>8</b> x <b>92.00</b>	736.00	D	
number of designation fees payable (maximum 8)			
Add amounts entered at B and D and enter total at I	1,163.00	I	
<i>(Applicants from certain States are entitled to a reduction of 75% of the international fee. Where the applicant is (or all applicants are) so entitled, the total to be entered at I is 25% of the sum of the amounts entered at B and D.)</i>			
4. FEE FOR PRIORITY DOCUMENT (if applicable) .....	30.00	P	
5. TOTAL FEES PAYABLE .....	1,883.00		
Add amounts entered at T, S, I and P, and enter total in the TOTAL box	TOTAL		

240

450

427

427

736

1163

30

1883

☐ The designation fees are not paid at this time.

#### MODE OF PAYMENT

<input type="checkbox"/> authorization to charge deposit account (see below)	<input type="checkbox"/> bank draft	<input type="checkbox"/> coupons
<input checked="" type="checkbox"/> cheque	<input type="checkbox"/> cash	<input type="checkbox"/> other (specify):
<input type="checkbox"/> postal money order	<input type="checkbox"/> revenue stamps	

#### DEPOSIT ACCOUNT AUTHORIZATION *(this mode of payment may not be available at all receiving Offices)*

The RO/ **US** ☐ is hereby authorized to charge the total fees indicated above to my deposit account.

☒ *(this check-box may be marked only if the conditions for deposit accounts of the receiving Office so permit)* is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.

☐ is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account.

**13-3405** **29 September 2000**

Deposit Account No. \_\_\_\_\_ Date (day/month/year) \_\_\_\_\_ Signature \_\_\_\_\_

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 1237-PCT-00	<b>FOR FURTHER ACTION</b>	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US00/26858	International filing date ( <i>day/month/year</i> ) 29 SEPTEMBER 2000	(Earliest) Priority Date ( <i>day/month/year</i> ) 01 OCTOBER 1999
Applicant INFRAWORKS CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 3

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☒ because this figure better characterizes the invention.
- ☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/26858

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

NEW ABSTRACT

A method for providing data security in a device for accessing data. The device driver detects a file system request(210), completes the file system request, and receives return information from the file system request. The device driver(211) further determines whether the file system request is for a tag file associated with a secured file; and if so, modifies(212) the return information to reflect a file attribute of the secured file.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/26858

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 11/00; 11/30

US CL : 707/9,101; 713/193,200; 709/227

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/9,101; 713/193,200; 709/227

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,931,947 A(BURNS et al.) 03 August 1999, col.6, lines 18-42, col.11, lines 14-45	1-34
Y	US 5,892,903 A(KLAUS)06 April 1999, col.11, lines 15-31, col.12, lines 28-38.	1-34
A	US 5,694,580 A(NARITA et al) 02 December 1997, col.6, lines 45-67, col.9, lines 38-65	1-34

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

15 DECEMBER 2000

Date of mailing of the international search report

22 JAN 2001

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

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Authorized officer

GAIL HAYES

Telephone No. (703) 305-0042

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/26858

## B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

STN

search terms: files,spoofing,encrypt,cipher,encipher,tag,attribute,secure,request

**INTERNATIONAL SEARCH REPORT**  
Form PCT/ISA/210 (second sheet) (July 1998)  
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International application No.  
PCT/US00/26858

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) :G06F 11/00; 11/30

US CL :707/9,101;713/193,200; 709/227

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/9,101;713/193,200; 709/227

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,931,947 A(BURNS et al.) 03 August 1999, col.6, lines 18-42, col.11, lines 14-45	1-34
Y	US 5,892,903 A(KLAUS)06 April 1999, col.11,lines 15-31,col.12, lines 28-38.	1-34
A	US 5,694,580 A(NARITA et al) 02 December 1997, col.6,lines45-67, col.9,lines 38-65	1-34

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

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Facsimile No. (703) 305-0040

Authorized officer AND Telephone No.  
GAIL HAYES

(703) 305-0042

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

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**INTERNATIONAL SEARCH REPORT**  
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**B. FIELDS SEARCHED**

Electronic data bases consulted (Name of data base and where practicable terms used):

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(71) Applicant (for all designated States except US): **INFRA-WORKS CORPORATION [US/US];** Suite 1100, 504 Lavaca Street, Austin, TX 78701 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **FRIEDMAN,**

George [US/US]; 7109 Montana Norte, Austin, TX 78731 (US). **STAREK, Robert, Phillip [US/US];** 3609 Del Robles, Austin, TX 78727 (US). **MURDOCK, Carlos [US/US];** 4517 Avenue F, Austin, TX 78751 (US).

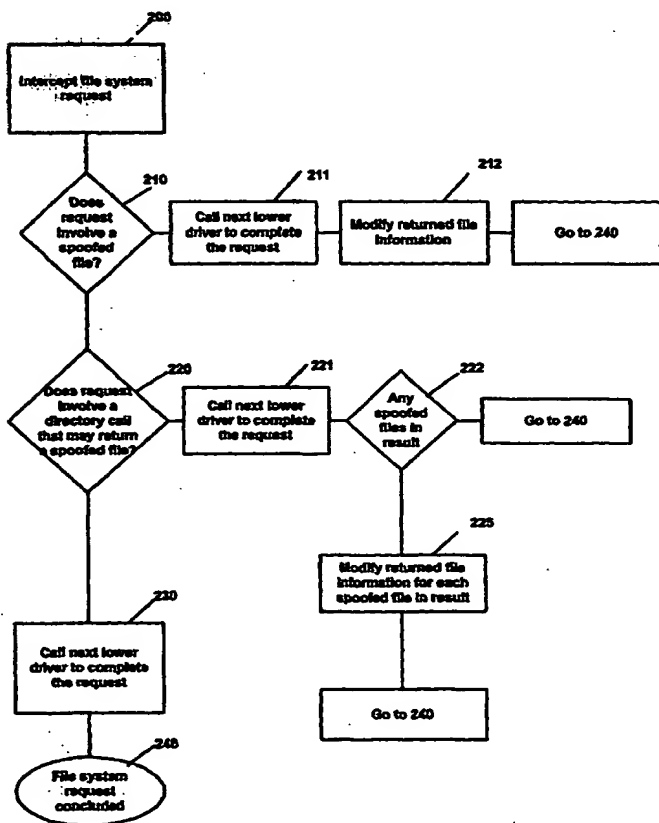
(74) Agents: **CHRISTENBURY, T., Daniel et al.;** Schnader Harrison Segal & Lewis, LLP, Suite 3600, 1600 Market Street, Philadelphia, PA 19103-7286 (US).

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[Continued on next page]

(54) Title: **METHOD AND SYSTEM FOR PROVIDING DATA SECURITY USING FILE SPOOFING**



(57) Abstract: A method for providing data security in a device for accessing data. The device driver detects a file system request (210), completes the file system request, and receives return information from the file system request. The device driver (211) further determines whether the file system request is for a tag file associated with a secured file; and if so, modifies (212) the return information to reflect a file attribute of the secured file.

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**METHOD AND SYSTEM FOR PROVIDING DATA SECURITY**  
**USING FILE SPOOFING**

**Field of the Invention**

5                   The present invention pertains to the field of file systems in electronic computers. In particular, the invention relates to a method and system for providing data security using file spoofing.

**Background of the Invention**

10                  Data security is a serious concern of computer users and owners of intellectual property. It is increasingly common to use measures such as encryption to secure data files, to protect data from loss or unauthorized activity.

                  Computer systems typically include one or more local or networked data storage devices. A typical application program executing on such a computer system accesses such data storage  
15                  devices by calling standard file system services provided by an operating system, such as services for creating, reading, and writing files on the data storage devices.

                  A device driver is a set of computer-implemented instructions that implements the device-specific aspects of generic input/output operations. In typical operating systems, software applications such as device drivers run in either "kernel mode" or "user mode." A virtual device  
20                  driver is a type of device driver that has direct access to an operating system kernel, such as by running in kernel mode. "Kernel mode" is a highly privileged memory access mode of the processor. "User mode" is a less privileged memory access mode of the processor. The memory access mode is a part of the hardware state of the processor. The kernel mode privilege level is also known as "Ring 0," and the user mode privilege level is also known as "Ring 3." Kernel  
25                  mode access allows the virtual device driver to interact with system and hardware resources at a very low level.

                  In conventional operating systems, device drivers may be represented as layered on top of one another. The layered architecture is also sometimes referred to as a stack or a calling chain. It is the lowest-level device driver that typically controls a hardware device. If there is only a  
30                  single device driver above the hardware device, the driver is called a monolithic driver. However, a plurality of drivers may be placed above the lowest-level driver. Input and output requests ("I/O requests") to the hardware device or devices controlled by a lowest-level driver are handled first by the highest-level driver, then seriatim by any lower-level intermediate drivers,

and finally by the lowest-level driver.

A file system driver is generally a highest-level driver, layered above a device driver for a data storage device such as a hard disk drive. The file system driver implements high-level aspects of I/O requests directed to the file system, such as requests to create, open, extend, and delete files and directories. A plurality of file system drivers may exist in a single computer, and file system drivers may be specific to different types of file systems, such as the FAT and NTFS file systems.

It is known in the art to monitor file I/O requests in operating systems having an installable file system manager and layered device drivers, such as the Windows 95®, Windows 98®, and Windows Me® operating systems available from Microsoft Corporation of Redmond, Washington, and collectively referred to herein as "Windows 9x". In Windows 9x operating systems, file system monitoring may be accomplished by registering a file system applications programming interface hook with the installable file system manager. Windows 9x provides a function called IFSMGR\_InstallFileSystemApiHook which is designed to be used for monitoring I/O requests to a file system. This service allows virtual device drivers to monitor all file system activity by hooking into the file system calls. By means of a call during system initialization to IFSMGR\_InstallFileSystemApiHook, a virtual device driver may insert itself onto the stack of all file system requests.

A somewhat different approach has been used to monitor file systems on object-oriented operating systems, such as the Windows NT® operating system and successor operating systems such as Windows 2000®, available from Microsoft Corporation of Redmond, Washington, and collectively referred to herein as "Windows NT." In Windows NT, I/O requests are described by data structures known as I/O Request Packets ("IRPs"), which are used for communication between software applications and drivers. All IRPs to hardware devices are handled by device drivers operating in kernel mode. High-level, intermediate, and low-level drivers exchange IRPs to complete a given I/O request. The lowest-level driver calls an NT layer known as the Hardware Access Layer (HAL) to gain direct control of the hardware. It is known on a Windows NT system to implement a file system monitor as a device driver object that creates filter device objects and attaches those objects to target file system device objects, so that the file system monitor will see all IRPs directed to the monitored data storage devices.

It is known to store secured files, such as encrypted files, alongside unsecured files in the same file system. The encrypted file appears in the file directory like any other file, with relevant file attributes such as name and size. However, the data contained in the file is unintelligible to

user applications until decrypted. Furthermore, the encryption process is likely to result in the size of the file becoming larger or smaller than the original unencrypted data. In such a case, a request to the file system to determine the file size would not reliably return the actual size of the original data. From the user's point of view, this type of data security lacks the desirable feature of transparency.

It is also known to store secured files in a special physical or virtual location apart from the ordinary file system. Such locations may include remote networked devices, encrypted or password-protected file systems, or other virtual secured file systems. This type of data security prevents the user from freely intermingling secured and unsecured files in a single file directory, even though the files may be logically related to one another. Although a user may set up, in the unsecured directory, symbolic links or shortcuts to secured files in another location, such an exercise for authorized persons adds an undesirable layer of obfuscation and effort to the process of conveniently accessing secured data.

## **Summary of the Invention**

It is a principal object of the present invention to provide a more convenient way for users to obtain information in connection with secured data files or file systems.

Another object of the present invention is to prevent unauthorized device drivers from obtaining information in connection with secured data files or file systems.

These and other objects are provided by a method and system for providing data security using file spoofing.

More particularly, the present invention relates to a method for providing data security in a device driver for accessing data. The device driver detects a file system request, completes the file system request, and receives return information from the file system request. The device driver further determines whether the file system request is for a tag file associated with a secured file; and if so, modifies the return information to reflect a file attribute of the secured file.

In another aspect, the invention relates to a system for providing data security, the system comprising a device driver for accessing data. The device driver is operably installed in an operating system on an electronic computer. The device driver detects a file system request, completes the file system request, receives return information from the file system request, determines whether the file system request is for a tag file associated with a secured file; and if so, modifies the return information to reflect a file attribute of the secured file.

In still another aspect, the invention comprises a machine-readable medium comprising a device driver program for accessing data. In yet another aspect, the invention comprises a computer-implemented device driver for accessing data.

Further objects and advantages of this invention will become apparent from the detailed description of a preferred embodiment, which follows.

### **Brief Description of the Drawings**

The present invention is described in further detail with reference to the accompanying drawings. The figures of the accompanying drawings illustrate the present invention by way of example and not limitation.

FIG. 1 is a diagram of the system architecture layout of the Windows 9x operating system.

FIG. 2 is a diagram of the system architecture layout of the Windows NT operating system.

FIG. 3 is a flow chart illustrating an embodiment of the file spoofing method of the present invention.

### **Detailed Description of Preferred Embodiments of the Invention**

The invention will be understood more fully from the detailed description given below; which, however, should not be taken to limit the invention to a specific embodiment, but is for explanation and understanding only.

The terms "computer" or "computer system," as used herein, include any device capable of receiving, transmitting, and/or using information, including, without limitation, a processor; a microprocessor; a personal computer, such as a laptop, palm PC, desktop or workstation; a network server; a mainframe; an electronic wired or wireless device, such as for example, a telephone; an interactive television or electronic box attached to a television, such as for example, a television adapted to be connected to the Internet; a cellular telephone; a personal digital assistant; an electronic pager; and a digital watch. In an illustrative example, information is transmitted in the form of e-mail. A computer, computer system, or system of the invention may operate in communication with other systems over a network, such as, for example, the Internet, an intranet, or an extranet, or may operate as a stand-alone system.

It should also be understood that the terms "device driver" or "driver," as used herein, include any computer-implemented instructions for directly or indirectly accessing or controlling

hardware devices, including, without limitation, device drivers, virtual device drivers (VxDs), instructions using NT kernel mode architecture, instructions using Win32 driver model (WDM), and other instructions, in any computer language, directed to any computer, computer architecture, network, or operating system.

5       The terms "information" and "data" as used herein are each intended to include the broadest definition of the other, and each include text, audio and video data. By way of further example, the term "information" can mean raw data, processed data, or a combination of raw and processed data.

10       Although the embodiment illustrated in the figures comprises a device driver described for illustrative purposes as a "file system monitor," the term "file system monitor" as used herein refers generally to a device driver of any kind using the file spoofing of the present invention. Device drivers within the scope of the invention may perform any sort of useful function that may be performed by a device driver, including, without limitation, general-purpose monitoring, permission monitoring, filtering, encryption, decryption, virus detection, data mirroring, I/O  
15 functions directed toward any device, and other functions, and are not limited to either monitoring or to functions related to file systems. Any device driver which accomplishes file spoofing appropriately falls within the scope of the present invention.

One embodiment of the present invention may be implemented on a Windows 9x operating system. Referring now to FIG. 1, components of the Windows 9x operating system are  
20 divided between user mode code 10 and kernel mode code 30, which provide different levels of system protection. For one embodiment, the user mode code 10 includes a system virtual machine 20 capable of running 16-bit and 32-bit software applications 21-22, and a plurality of MS-DOS virtual machines 25. In this embodiment, the kernel mode code 30 comprises low-level operating system services and virtual device drivers, such as a virtual machine manager 40,  
25 a file system monitor 50 of the present invention, and an installable file system manager 60.

Beneath the installable file system manager 60 are a plurality of file system drivers 70-72 for file systems such as FAT and NTFS. Beneath the file system drivers 70-72 is a block I/O subsystem 80. The block I/O subsystem 80 includes an I/O supervisor 81 which manages requests as they pass through the file system hierarchy, a monolithic driver 82 for port I/O, and a  
30 layered plurality of device drivers 83-84.

In this embodiment, the first device driver 50 intercepts all I/O requests from user mode code 10 and from applications 21-22 running in user mode 10, before the I/O requests are sent to the installable file system manager 60. The first device driver 50 is able to monitor and, if

desired, filter all file system activity occurring in the installable file system manager 60, file system drivers 70-72, and block I/O subsystem 80. By means of a call during system initialization to IFSMGR\_InstallFileSystemApiHook, the first device driver 50 is hooked into such calls when the operating system is started or restarted, at which time it is inserted into a functionally uppermost position on the stack of all file system requests. From the installable file system manager 60 down through each driver in the layered plurality 83-84, an I/O request is passed from the highest level to the lowest level, and the devices can also view the result of a request as it passes back up the stack to the source of the I/O request. Each device driver on the stack may service an I/O request itself and not pass the I/O request to lower levels, or may, if desired, itself generate a new I/O request. Such device drivers may implement functions that require waiting, such as for an interrupt, or for a device to become available. During such waiting periods the device driver simply returns to its caller, allowing the calling application or device driver to perform other work in parallel with the I/O request. In the alternative, the calling application or device driver can simply wait ("block") until the I/O request is complete.

In another embodiment, illustrated with reference to FIG. 2, the present invention may be implemented on a Windows NT operating system. As is well known in the art, an application 100 running in user mode under Windows NT may send an I/O request to operating system services 110. I/O manager 120 receives I/O requests, and coordinates the transfer of I/O request packets among various drivers. In the alternative, the various drivers may communicate directly with each other without using an I/O manager 120 or other device to coordinate transfer of information among the various drivers.

The conventional input/output system of operating systems such as Windows NT comprises a plurality of device drivers 130-132 for processing I/O requests. Such device drivers are illustrated, for example, by file system drivers 130, and a layered plurality of device drivers 131-132. The I/O manager 120 typically delivers I/O request packets to the file system driver 130 responsible for managing the target of the I/O request. However, as is known in the art, a file system monitor 50 can attach to other device drivers 130-132 in an object-oriented fashion. Thereupon, the I/O manager 120 routes I/O request packets intended for the target device driver 130-132 to the file system monitor 50 that has attached to the target device driver 130-132. In this illustrative embodiment, the file system monitor 50 attaches to each of the plurality of file system driver objects 130.

FIG. 3 is a flow chart of one embodiment of a method for providing data security in a file system monitor 50 using file spoofing.

As shown in FIG. 3, the file spoofing process of the present invention is initiated, in step 200, each time a file system request is detected. In step 210, the process determines whether or not the file system request involves a spoofed file. The determination of step 210 is performed for any file system request that specifies a named file as the object of the request. Such file system requests include FILE\_OPEN to open a file, FILE\_DELETE to delete a file, and FILE\_RENAME to rename a file. In the Windows NT operating systems, such file system requests also include FILE\_QUERY\_INFORMATION to query file information, and FILE\_SET\_INFORMATION to set file information. Each of these calls requires a file name to be specified. In the determination of step 210, the specified file name is checked to determine whether the file is a spoofed file.

A spoofed file is a file which has been secured by placing the data in a secured file location where such data is not readily accessible to the user, such as, by way of illustration and not limitation, a secure or encrypted virtual file system, while maintaining a tag file in a user-accessible part of the file system to serve as a placeholder. To save disk space, the tag file may be zero bytes in length. In one embodiment, from the point of view of the user, the tag file transparently appears to contain the secured data, and the file spoofing process will enable any file system request to reach the secured file location.

To determine whether a file is a spoofed file, the process checks the file name against a database of all spoofed files, and if the file is a spoofed file, the process determines the secured file associated with the tag file. In an alternate embodiment, the process may rely on data stored in the tag file.

If the determination of step 210 is that the file request involves a spoofed file, the process continues at step 211 and completes the file system request. In one embodiment, the process calls the next lower driver to complete the file system request for the tag file. In an alternate embodiment, the process rewrites the file system request to refer to the secured file instead of the tag file, and calls the next lower driver to complete the file system request for the secured file.

The process continues at step 212 by modifying the information returned by the file system request. File attributes, such as file size, are part of the information returned by file system requests. The process removes selected file attributes of the tag file from the return information, and substitutes the corresponding file attributes of the secured file. For example, where the file size of a tag file is zero, the user will instead see the file size of the corresponding secured file.

The process then concludes at step 240.

Returning to step 210, if the determination of step 210 is that the file request does not involve a spoofed file, the process continues at step 220 and determines whether the file system request involves a directory call that may return a spoofed file. Such file system requests in Windows 9x include FIND\_OPEN or FIND\_FIRST to find a first matching file, and

5 FIND\_NEXT to find a next matching file. In the Windows NT operating systems, such file system requests include DIRECTORY\_CONTROL, which provides a buffer of matching file names.

If the determination of step 220 is that the file system request involves a directory call that may return a spoofed file, the process continues at step 221 and completes the file system  
10 request. In one embodiment, the process calls the next lower driver to complete the file system request for the tag file. In an alternate embodiment, the process rewrites the file system request to refer to the secured file instead of the tag file, and calls the next lower driver to complete the file system request for the secured file.

The process continues at step 222 by determining whether the information returned by the  
15 file system request refers to any spoofed files. Requests to find a first matching file or a next matching file will each return a single file. A request to the Windows NT file system for directory control will return a buffer of file names, each of which must be considered. If no spoofed files are returned, the process concludes at step 240.

If any spoofed files are returned, the process continues at step 225 by modifying the  
20 information returned by the file system request. File attributes, such as file size, are part of the information returned by file system requests. The process removes selected file attributes of the tag file from the return information, and substitutes the corresponding file attributes of the secured file. For example, where the file size of a tag file is zero, the user will instead see the file size of the corresponding secured file. The process then concludes at step 240.

25 Returning to step 220, if the determination of step 220 is that the file system request does not involve a directory call that may return a spoofed file, the process continues at step 230 and completes the file system request, and concludes at step 240.

What have been described are only some examples of methods and systems according to the invention. Various modifications to the preferred embodiments will be readily apparent to  
30 those skilled in the art, and the generic principles defined herein may be applied to other embodiments and applications without departing from the spirit and scope of the invention. Thus, the present invention is not intended to be limited to the embodiments shown. On the contrary, it is to be understood that various and numerous other arrangements may be devised by



one skilled in the art without departing from the spirit and scope of the invention as limited only by the accompanying claims.

We claim:

1. A method for providing data security in a device driver for accessing data, the method comprising the steps of:

5

detecting a file system request;

completing said file system request;

10

receiving return information from said file system request;

determining whether said file system request is for a tag file associated with a secured file; and

15

if so, modifying said return information to reflect a file attribute of the secured file.

2. The method of claim 1 wherein said file attribute is file size.

3. The method of claim 1 wherein the step of determining further comprises the steps of:

20

determining whether said return information identifies a plurality of tag files associated with a plurality of secured files; and

if so, modifying said return information to reflect a file attribute of the plurality of  
25 secured files.

4. The method of claim 1 wherein the secured file is stored in encrypted form.

5. The method of claim 1 wherein the secured file is stored in a secure virtual file system.

30

6. The method of claim 1 wherein the secured file is stored on a remote networked device.

7. The method of claim 1 wherein the file system request is to open a file.

8. The method of claim 1 wherein the file system request is to delete a file.
9. The method of claim 1 wherein the file system request is to rename a file.
- 5 10. The method of claim 1 wherein the file system request is to query file information.
11. The method of claim 1 wherein the file system request is to set file information.
12. The method of claim 3 wherein the file system request is to find a first matching file.
- 10 13. The method of claim 3 wherein the file system request is to find a next matching file.
14. The method of claim 3 wherein the file system request is directory control.
- 15 15. A system for providing data security, the system comprising a device driver for accessing data, the device driver operably installed in an operating system on an electronic computer, wherein said device driver:
  - detects a file system request;
  - 20 completes said file system request;
  - receives return information from said file system request;
  - 25 determines whether said file system request is for a tag file associated with a secured file;
  - and
  - if so, modifies said return information to reflect a file attribute of the secured file.
- 30 16. The system of claim 15 wherein said file attribute is file size.
17. The system of claim 15 wherein said device driver further

determines whether said return information identifies a plurality of tag files associated with a plurality of secured files; and

5 if so, modifies said return information to reflect a file attribute of the plurality of secured files.

18. The system of claim 15 wherein said first device driver is a file system monitor.

19. The system of claim 15 wherein the secured file is stored in encrypted form.

10

20. The system of claim 15 wherein the secured file is stored in a secure virtual file system.

21. The system of claim 15 wherein the secured file is stored on a remote networked device.

15 22. The system of claim 15 wherein the file system request is to open a file.

23. The system of claim 15 wherein the file system request is to delete a file.

24. The system of claim 15 wherein the file system request is to rename a file.

20

25. The system of claim 15 wherein the file system request is to query file information.

26. The system of claim 15 wherein the file system request is to set file information.

25 27. The system of claim 17 wherein the file system request is to find a first matching file.

28. The system of claim 17 wherein the file system request is to find a next matching file.

29. The system of claim 17 wherein the file system request is directory control.

30

30. A machine-readable medium comprising a device driver program for accessing data, said device driver program comprising:

computer-implemented instructions for detecting a file system request;

computer-implemented instructions for completing said file system request;

5 computer-implemented instructions for receiving return information from said file system request;

computer-implemented instructions for determining whether said file system request is for a tag file associated with a secured file; and

10

computer-implemented instructions for modifying said return information to reflect a file attribute of the secured file, if said file system request is for a tag file associated with a secured file.

15 31. The machine-readable medium of claim 30 wherein the device driver program further comprises:

computer-implemented instructions for determining whether said return information identifies a plurality of tag files associated with a plurality of secured files; and

20

computer-implemented instructions for modifying said return information to reflect a file attribute of the plurality of secured files, if said return information identifies a plurality of tag files associated with a plurality of secured files.

25 32. A computer-implemented device driver for accessing data when operably installed in a computer operating system, said device driver comprising:

means for detecting a file system request;

30 means for completing said file system request;

means for receiving return information from said file system request;

means for determining whether said file system request is for a tag file associated with a secured file; and

5 means for modifying said return information to reflect a file attribute of the secured file, if said file system request is for a tag file associated with a secured file.

33. The computer-implemented device driver of claim 32 wherein said file attribute is file size.

10 34. The computer-implemented device driver of claim 32 further comprising:

means for determining whether said return information identifies a plurality of tag files associated with a plurality of secured files; and

15 means for modifying said return information to reflect a file attribute of the plurality of secured files, if said return information identifies a plurality of tag files associated with a plurality of secured files.

1/3

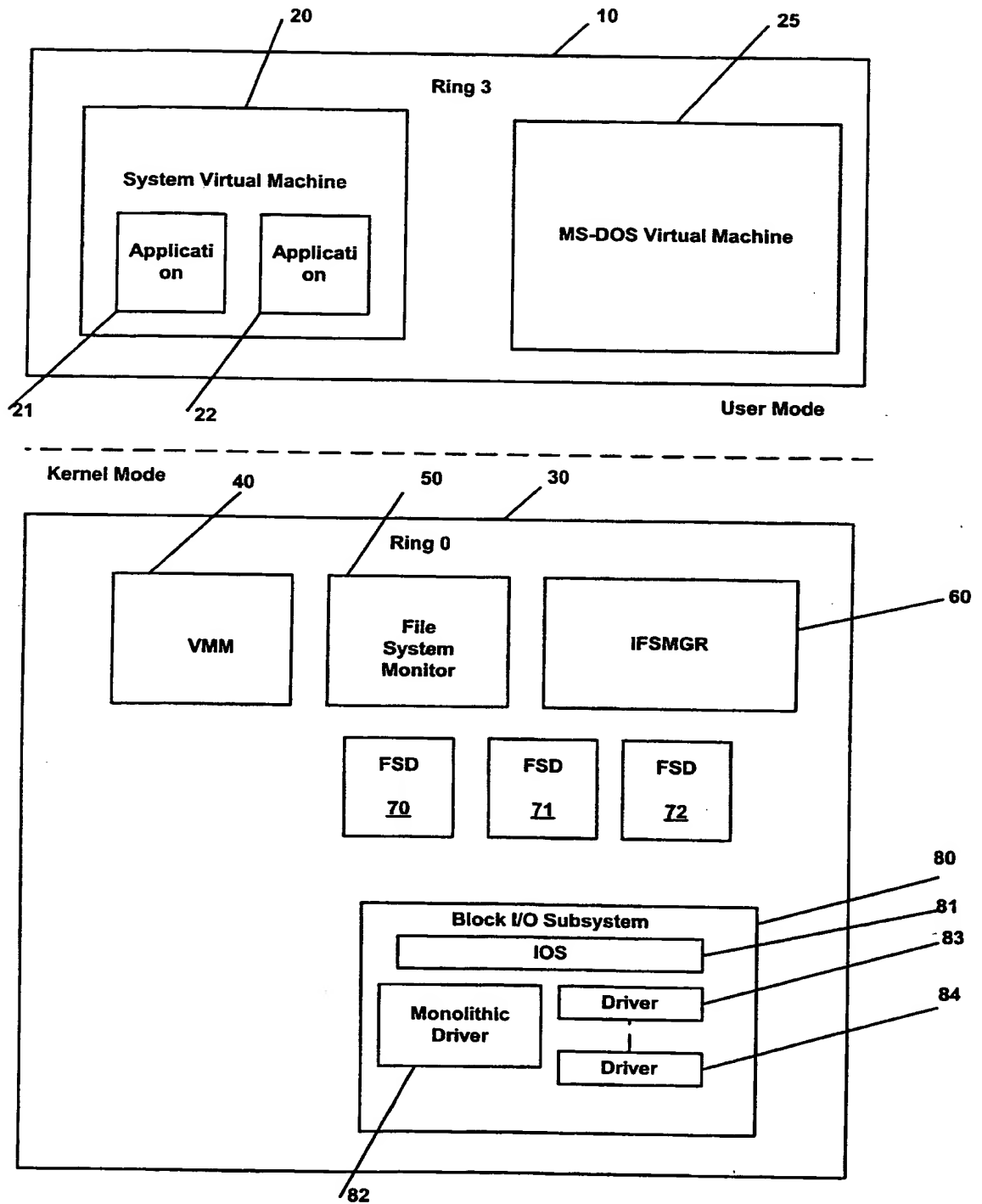


FIG. 1

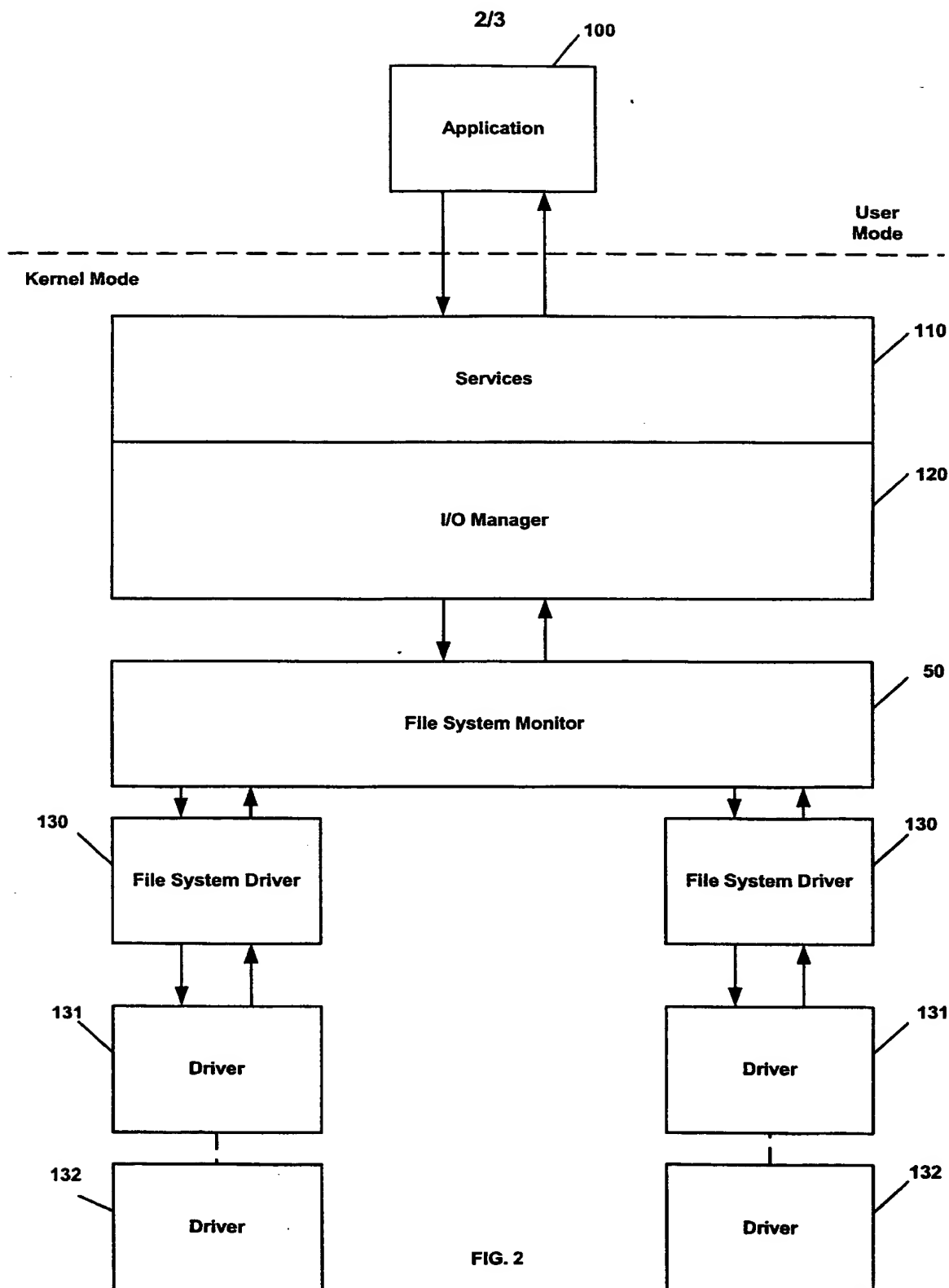


FIG. 2



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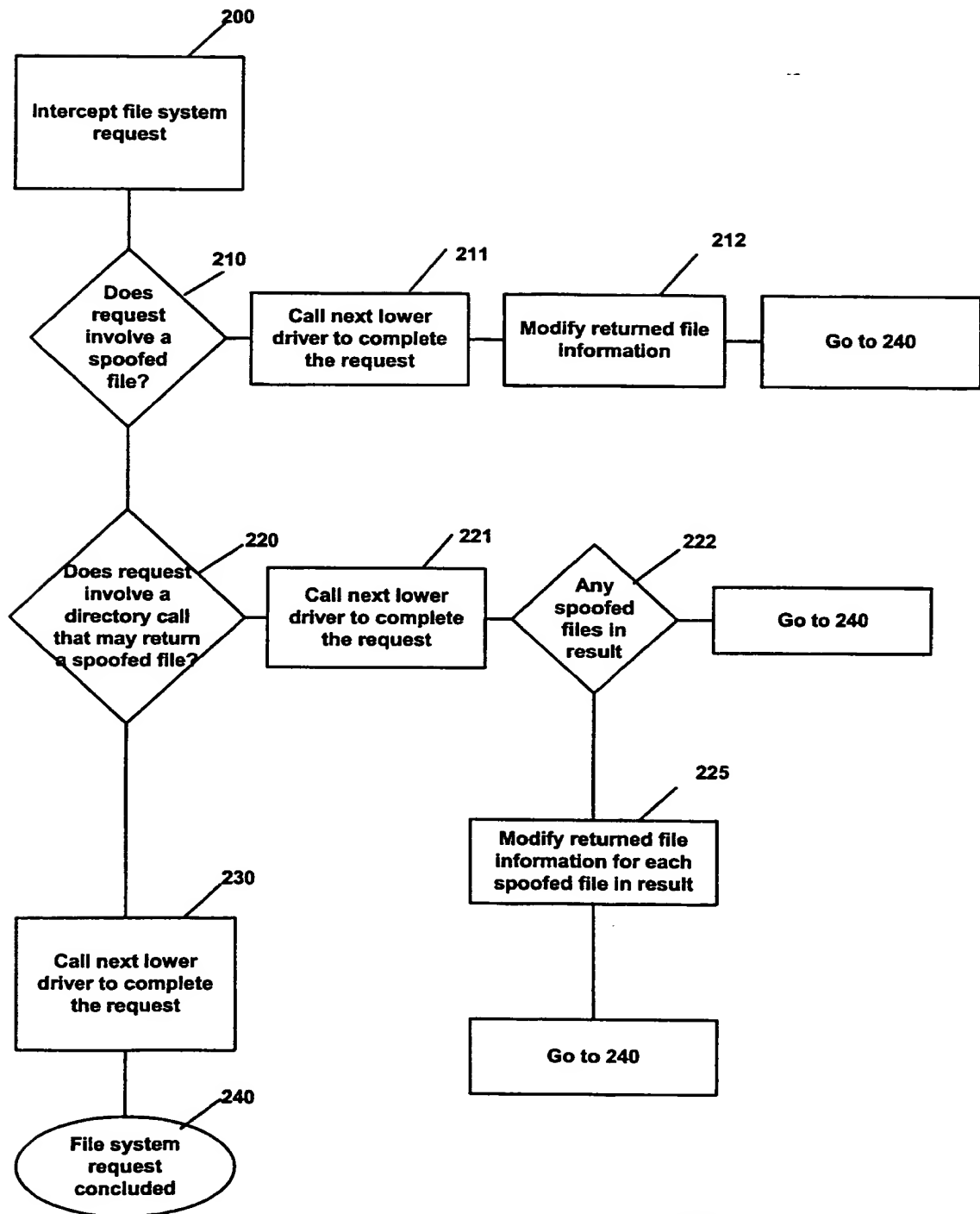


FIG. 3

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/26858

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :GO6F 11/00; 11/30

US CL :707/9,101:713/193,200; 709/227

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/9,101:713/193,200; 709/227

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,931,947 A(BURNS et al.) 03 August 1999, col.6, lines 18-42, col.11, lines 14-45	1-34
Y	US 5,892,903 A(KLAUS)06 April 1999, col.11,lines 15-31,col.12, lines 28-38.	1-34
A	US 5,694,580 A(NARITA et al) 02 December 1997, col.6,lines45-67, col.9,lines 38-65	1-34

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*g* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

15 DECEMBER 2000

Date of mailing of the international search report

22 JAN 2001

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-0040

Authorized officer

GAIL HAYES

Telephone No. (703) 305-0042

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/26858

## B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

STN

search terms: files.spoofing.encrypt.cipher.encipher.tag.attribute.secure.request